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ABSTRACT

Research directed toward examining clinical depression among college students requires valid criterion measures for identifying depressed individuals. The Beck Depression Inventory (BDI), the most widely-used self-report screening instrument for identifying depressed college students, has been criticized for its heavy emphasis on cognitive items resulting in a high false positive rate for classifying depressives. The Depressive Symptoms Questionnaire (DSQ), a self-report instrument loaded with somatic and behavioral components, was constructed. Undergraduates (N=673) completed both the BDI and the DSQ. To evaluate the classification validity of the cutting scores of the BDI, the DSQ, and the two instruments combined, 48 diagnostic interviews were conducted by clinical psychology graduate students. Results showed that the hit rate for true positives of the BDI/DSQ-screened group was significantly greater than the hit rate for the BDI-screened group. The combination of the BDI and DSQ improved the identification of diagnosable depressed college students and identified significantly more individuals with major depressive episodes. (Author/NRB)

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A Methodological Contribution to Identifying Depressed College Students

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A Methodological Contribution to Identifying Depressed College Students

Research directed toward examining clinical depression among college students requires the use of valid criterion measures for identifying depressed individuals, the appropriate procedure being comprehensive clinical interviews (Depue & Monroe, 1978). Supplementing with appropriate tests or rating scales, such as the MMPI or the Hamilton Rating Scale (Hamilton, 1960), is also desirable (Garfield, 1978).

To reduce costs it would be advantageous to have self-report screening measures that are relatively efficient in identifying depressed individuals. The Beck Depression Inventory (BDI; Beck, et al., 1961) is the most widely-used self-report screening instrument for identifying depressed college students. Although some studies have suggested that the BDI is valid for this purpose (Bumberry, Oliver, & McClure, 1978; Hammen, 1980), Depue and Monroe (1978) have argued that the BDI's relatively minor emphasis on behavioral and somatic items (33%), combined with a heavy loading on cognitive and subjective items, "may create problems in its ability to differentiate between mild depressions in relatively normal subjects and more severely depressed clinical cases..." (p. 17). Hammen (1980) screened college freshmen, selecting those with a BDI cutting score of about 16 (moderate depression).[1] Of 34 students selected for diagnostic interviews only 13 (about 36%) were found to manifest significant depressive symptoms (8 definite or probable minor depressive disorders and 5 definite or probable major depressive disorders).

The present study supplemented a BDI screening procedure with an additional screening device based on the DSM-III (American Psychiatric Association, 1980) criteria for depressive episodes. It was expected that emphasis on DSM-III criteria, which are heavily loaded with somatic and behavioral components, would facilitate the identification of depressed individuals.

Method

A 29-item self-report instrument, the Depressive Symptoms Questionnaire (DSQ), was constructed.[2] The DSQ items were self-referenced descriptive statements designed to tap a number of depressive symptoms, including dysphoric mood, appetite and sleep disturbances, psychomotor changes, decreased energy, feelings of worthlessness or guilt, and the like. Nineteen items were derived from the DSM-III diagnostic criteria for major depressive episodes. Ten statements depicting more positive experiences (e.g. looking forward to meal times, developing new interests, etc.) were added as filler items. One component of the DSM-III criteria for a depressive episode requires the presence of symptoms nearly every day for a period of at least two weeks. Individuals completing the DSQ indicated the extent to which each described feeling or experience applied to them on a four-point scale (0 = not at all, to 3 = nearly every day during the last two weeks).

Undergraduates (N = 673) enrolled in introductory psychology courses completed the BDI and the DSQ. The mean age for this group was 18.8 (SD = 1.93).

The DSQ was scored by summing the scores across the 19 DSM-III-based items (range = 0 - 47, M = 10.48, SD = 7.42). The BDI scores ranged from 0 - 33 (M = 6.57, SD = 5.60). The Pearson correlation coefficient between the BDI and DSQ scores was .711. Sixty students scored at least 16 on the BDI, approximately the 93rd percentile score. The DSQ score of 23 corresponded most closely to the 93rd percentile score, and 48 students scored at least 23. Twenty-five students scored at or above the respective cutting scores on both instruments. To evaluate the classification validity of each of these three groups, 48 diagnostic interviews (N = 16 in each of these three groups) were conducted within 2-4 weeks of the screenings by six experienced clinical psychology graduate students (3 male and 3 female). The BDI, DSQ, and the Crowne-Marlowe Social Desirability Scale (SDS, Crowne & Marlowe, 1964) were administered just prior to the interview. The SDS was given to assess the possible influence of a social desirability response set among interviewees. The blind interviewers focused on determining, in a retrospective fashion, the diagnostic status of each student at the time of the screening. Similar to Hammen's (1980) procedure, diagnostic decisions were based on the Research Diagnostic Criteria (Spitzer, et al., 1978) and the Hamilton Rating Scale. In addition to interviewer diagnostic decisions, a general severity rating for depression was made on a four-point scale (1 = not depressed, 2 = mildly to 4 = severely depressed).

Interjudge reliabilities were assessed by randomly selecting and audiotaping 24 of the 48 diagnostic interviews, each of which was then blindly rated by one of six independent raters. The Pearson correlation

coefficient for interjudge reliability on HRS ratings was .763, and for severity ratings was .778.

Results

Social Desirability Scores. The interviewed sample obtained a mean SDS score of 14.04, (SD = 4.5). Pearson correlation coefficients between SDS scores and each of the interview-based depression indices were nonsignificant, (magnitude of all rs < .250).

Depression Indices. The interviewees yielded a mean BDI score of 16.15 (SD = 5.9) at screening. The DSQ mean was 24.42 (SD = 6.9) at screening. The BDI mean decreased to 12.00 (SD = 6.8) at the interview, comparable to the trend reported by Hammen (1980). The DSQ mean decreased to 17.5 (SD = 9.1) at interview. Table 1 presents the three groups and the corresponding depression measures obtained at interview.

Insert Table 1 about here

As Table 1 shows, the mean scores for all depression measures (HRS, BDI, and DSQ scores, and the severity ratings) was highest for the BDI/DSQ-screened group. Four a priori contrast equations were performed on these depression measures to test the respective cell mean weightings of -1, -1, +2 for the BDI-screened, DSQ-screened, and BDI/DSQ-screened groups (Winer, 1977, pp. 177-185). All these analyses yielded significant results (for HRS scores, t (45) = 3.57, $p < .001$; BDI scores, t (45) = 2.56, $p < .05$; DSQ scores, t (45) = 4.19, $p < .001$; severity ratings, t (45) = 2.72, $p < .01$), Thus the prediction that the BDI/DSQ-screened group would have the highest depression level means was confirmed. As expected all a priori tests of

the orthogonal contrast equation for respective cell means of -1, 0, +1, were nonsignificant.

Diagnosis. Application of the RDC in the interviews resulted in a diagnosis of 10 definite or probable major depressive disorders, 17 definite or probable minor depressive disorders; the remaining 21 students were diagnosed as nondepressed. As shown in Table 1, the use of the BDI as the sole screening criterion resulted in the diagnosis of 1 major depressive disorder and 5 minor depressive disorders (definite or probable), a .375 hit rate for true positives. The DSQ-screened group showed a hit rate of .563. In contrast, the hit rate for true positives in the BDI/DSQ-screened group was .75. Chi-square analyses showed that there were no between-group differences in the number of minor depressive disorders (definite or probable). Chi-square analyses on the number of major depressive disorders among the three groups yielded no differences between the BDI-screened group and the DSQ-screened group, or between the BDI/DSQ- screened group and the DSQ-screened group. However, the comparison between the BDI/DSQ-screened group and the BDI-screened group was significant ($\chi^2(1) = 4.50$, $p < .05$).

Estimation of unselected true positive rate. One consideration in evaluating the obtained .75 hit rate for true positives in the BDI/DSQ-screened group is that the BDI-screened and DSQ-screened groups were diagnostically assessed with the exclusion of those individuals scoring above the cutting scores on both of the screening instruments. It was thus methodologically appropriate to estimate the unselected true positive rates for the BDI and the DSQ, weighted according to the obtained incidence

of scores falling at or above the cutting scores on the BDI and DSQ, respectively. These rates were estimated with the equation, $x = (ab + cd)/(a + c)$, where x is the estimated unselected true positive rate for a given instrument, a is the total number of individuals in the screening sample who scored at or above the cutting score on the given instrument but below the cutting score on the alternate instrument, b is the corresponding true positive hit rate obtained using the instrument, c is the total number of individuals in the screening sample who scored at or above the cutting scores on both instruments, and d is the corresponding true positive hit rate obtained from the group selected on the basis of scoring at or above the cutting scores on both instruments (i.e., the .75 hit rate found in the BDI/DSQ-screened group). These computations resulted in estimated unselected true positive rates of .531 for the Beck Depression Inventory and .660 for the Depressive Symptoms Questionnaire.

Discussion

Supplementing the BDI with a self-report instrument based on the DSM-III criteria for a depressive episode facilitated the identification of college students with diagnosable depression. The specific impact of the two-instrument selection procedure was to improve the probability of identifying screened individuals with major depressive disorders. It should be cautioned that the present findings warrant cross-validation. However the results show promise for investigators interested in diagnostic research examining depressive symptom patterns among college students or more generally, in further experimental studies in depression.

Since it was not the intent of this study to determine the maximally efficient cutting-scores on the BDI and DSQ, diagnostic interviews were not conducted among individuals falling below the respective cutting scores. It would be useful to address this issue with additional research.

Footnotes

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[1]Hammen (1980) supplemented the interviewed group with 6 students scoring 15 on the BDI.

[2]The DSQ is available from the first author upon request.

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Table 1

Interview-Based Classifications and Depression Measures by Group

Group[a]	Classification results			Depression measures							
	Number of major depressive disorders	Number of minor depressive disorders	Number of non-depressed	HRS scores at interview		BDI scores at interview		DSQ scores at interview		Severity rating	
				M	SD	M	SD	M	SD	M	SD
BDI-screened	1	5	10	8.5	4.90	11.4	4.87	12.1	6.45	1.4	.63
DSQ-screened	2	7	7	9.2	6.91	9.2	8.02	16.3	7.36	1.9	1.02
BDI/DSQ-screened	7	5	4	17.1	9.88	15.4	6.12	24.2	9.22	2.4	1.09

Note: HRS = Hamilton Rating Scale, BDI = Beck Depression Inventory, and DSQ = Depressive Symptoms Questionnaire

[a] n = 16 for each group. See text for criteria used for group assignment.